Patient Satisfaction with Breasts and Psychosocial, Sexual, and Physical Well-Being after Breast Augmentation in Male-to-Female Transsexuals

Romain Weigert, M.D.
Eric Frison, M.D.
Quentin Sessiecq, M.D.
Khalid Al Mutairi, M.D.
Vincent Casoli, M.D., Ph.D.

Bordeaux, France

Background: Satisfaction with breasts, sexual well-being, psychosocial well-being, and physical well-being are essential outcome factors following breast augmentation surgery in male-to-female transsexual patients. The aim of this study was to measure change in patient satisfaction with breasts and sexual, physical, and psychosocial well-being after breast augmentation in male-to-female transsexual patients.

Methods: All consecutive male-to-female transsexual patients who underwent breast augmentation between 2008 and 2012 were asked to complete the BREAST-Q Augmentation module questionnaire before surgery, at 4 months, and later after surgery. A prospective cohort study was designed and postoperative scores were compared with baseline scores. Satisfaction with breasts and sexual, physical, and psychosocial outcomes assessment was based on the BREAST-Q.

Results: Thirty-five male-to-female transsexual patients completed the questionnaires. BREAST-Q subscale median scores (satisfaction with breasts, +59 points; sexual well-being, +34 points; and psychosocial well-being, +48 points) improved significantly ($p < 0.05$) at 4 months postoperatively and later. No significant change was observed in physical well-being.

Conclusions: In this prospective, noncomparative, cohort study, the current results suggest that the gains in breast satisfaction, psychosocial well-being, and sexual well-being after male-to-female transsexual patients undergo breast augmentation are statistically significant and clinically meaningful to the patient at 4 months after surgery and in the long term. (*Plast. Reconstr. Surg.* 132: 1421, 2013.)

CLINICAL QUESTION/LEVEL OF EVIDENCE: Therapeutic, IV.

Breast augmentation in male-to-female transsexuals is part of gender reassignment surgery. Hormonal feminization might not be sufficient to induce mammogenesis,[1] so many patients seek surgery for their chests to resemble the female gender. Literature describes techniques and results.[2–6] The World Professional Association for Transgender Health, in the seventh version of the Standards of Care for the Health of Transsexual, Transgender, and Gender Nonconforming People emphasizes that, although breast augmentation can be labeled as an aesthetic procedure, this operation can be medically necessary, depending on the unique clinical situation of a given patient's condition and life situation.[7] No studies report sexual, psychosocial, and health-related quality-of-life changes after breast augmentation in male-to-female transsexuals. The purpose of this study was to evaluate the impact of breast augmentation on patient-reported satisfaction with breasts and sexual, physical, and psychosocial well-being.

From the Plastic Surgery and Burns Unit, Centre FX Michelet, Bordeaux University Hospital; and CHU de Bordeaux, Pôle de Santé Publique, Service d'Information Médicale.
Received for publication February 13, 2013; accepted May 2, 2013.
Presented at the French Society of Plastic, Reconstructive and Aesthetic Surgery Annual Meeting, in Paris, France, November 19 through 21, 2012.

DOI: 10.1097/01.prs.0000434415.70711.49

Disclosure: *The authors have no financial interest to declare in relation to the content of this article.*

PATIENTS AND METHODS

Study Sample

Research ethics board approval was granted for this study from the University of Bordeaux Segalen, Bordeaux, France. Patients were recruited from the Hospital Transgender Health Network (Bordeaux University Hospital, Bordeaux, France) from July of 2008 through July of 2012. Breast augmentation procedures were all paid for by health insurance after a medical counselor granted approval. Inclusion criteria were age 18 years or older, capacity to make a fully informed decision and to consent for treatment, sex reassignment surgery already performed, at least 12 months of feminizing hormone therapy, no previous breast surgery, and primary augmentation mammaplasty with the same surgeon.

Data Collection

In accordance with the European Directive 95/46/EC of the European Parliament and of the European Council of October 24, 1995, on the protection of individuals with regard to the processing of personal data and on the free movement of such data, the database has been declared at the Commission Nationale de l'Informatique et des Libertés, which is the independent French administrative authority protecting privacy and personal data. After being informed on the study, verbal consent was obtained from the patients. They were asked to complete the BREAST-Q Augmentation module at three time points: (1) at 3 weeks preoperatively and (2) at 4 months and (3) at least 12 months after completion of breast augmentation. Patient and treatment data were collected at baseline and after the procedure. Patient information included age, height, weight, body mass index, employment, tobacco status, date of beginning of hormone therapy, date of sex reassignment surgery, sternal notch–to-nipple distance, and breast width. Treatment information included date of surgery, position of incision, pocket plane, and size and shape of the implants. After surgery, surgical information was obtained from the electronic patient record on operative procedure, significant postoperative complications (e.g., hematoma, infection, and capsular contracture), and hospitalization stay.

BREAST-Q

The BREAST-Q Augmentation module is a patient-reported outcome measure that was specifically designed to assess the health-related quality of life and patient satisfaction after breast augmentation.[8] This instrument was developed and validated with strict adherence to recommended international guidelines[9–11] to remedy the lack of instruments for breast surgery patients.[12] In the original development study, all scales were found to fulfill criteria for good measurement.[8,13] The BREAST-Q was further validated to be appropriately used in clinical research and practice.[14] Four subscales measure well-being and satisfaction before and after augmentation:

1. The Augmentation module's 17-item subscale, satisfaction with breasts, addresses issues such as satisfaction with breast volume and shape; feel to touch; and one's appearance clothed, unclothed, and in a bra.
2. The Augmentation module's nine-item subscale, psychosocial well-being, addresses issues such as feelings of beauty, self-confidence, and self-worth.
3. The Augmentation module's five-item subscale, sexual well-being, addresses issues such as feelings of sexual attractiveness and sexual self-confidence.
4. The Augmentation module's seven-item subscale, physical well-being, addresses issues such as chest pain, sleeping discomfort, and physical activity discomfort.

Five additional subscales measure postaugmentation outcomes related to the satisfaction with outcome, information, medical staff, and office staff. However, because we were assessing the changes in health-related quality of life and patient satisfaction after breast augmentation, only the four subscales that included preaugmentation scores and postaugmentation scores were analyzed. Good psychometric properties have been reported for the BREAST-Q subscales used in the study (Cronbach α, 0.83 to 0.96). Good test-retest reliability has been reported (intraclass correlation coefficient, 0.90 to 0.96).[14] All raw questionnaire data were transformed into BREAST-Q scores using the Q-Score program.[15] Then, scores were computed in summary scores for each BREAST-Q subscale that range from 0 to 100, with higher values representing a more favorable outcome.

Surgery

Preoperative Evaluation

Current cross-sex hormone substitution was not standardized, even if almost all were treated by the same endocrinologist, and consisted of estrogens (100 μg of ethinyl estradiol per day orally).

The selection of implant volume was based both on the patient's chest anatomy and on preference. Evaluation included the expectations of the patient and other features such as the patient's height, weight, chest morphology, existing breast appearance, asymmetries, and thickness of the subcutaneous tissue in the upper and lower poles of the future breast. Information to patient emphasizes the difficulty to attenuate the wide intermammary cleft usually present in the masculine thorax. In our practice, we always choose anatomical implants to fulfill the lack of an axillary process.

All breast augmentations were performed with Perthèse Esthea anatomical breast implants (Perouse Plastie, a Mentor Company, Bornel, France) filled with a cohesive silicone gel with a microtextured surface. The Perthèse Esthea mammary anatomical implant line differentiates itself from other devices on the market through its original microtextured surface—the envelope consists of high-mechanical-resistance medical grade silicone elastomer vulcanized during the manufacturing process—and through specific different base shapes. Photographs were taken at the initial consultation and at the follow-up evaluation.

Operative Technique

All operations were performed with the patient under general anesthesia. Intercostal nerve block with 15 ml of 7.5 mg/ml ropivacaine was performed for blocking both sides. Preoperative antibiotics were given (cefazolin, 2 g intravenously). All patients had a 45- to 50-mm-long inframammary incision (Fig. 1). Dissection was performed using the electrocautery knife under direct vision. During the procedure, the centerline of the anatomical implant was positioned parallel to the inferior margin of the pectoralis major muscle so that it filled superolateral region toward the axilla. Wound closure was completed in layers using running 3-0 Monocryl (Ethicon GmbH, Norderstedt, Germany) for the fascia and subcutaneous fat because of its softness. Skin closure was performed with 3-0 monofilament resorbable Monocryl suture, placed intracutaneously at the mid-dermis level.

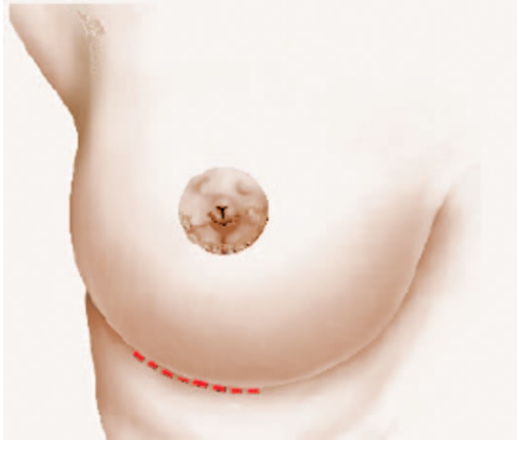

Fig. 1. Schematic diagram of the inframammary incision.

Postoperative Care

Breasts were immobilized for 2 days in a semicompressive dressing. Patients were given a specific supportive, properly sized bra with a front clasp. Drains were removed at the time of discharge from the hospital.

Postoperative Controls

Postoperative control assessments were performed at 2 days, 21 days, 4 months, 12 months, and later. Control assessments were performed for all patients by the operating surgeon (R.W.). At 4 months and after 12 months, the patients had to complete the postoperative BREAST-Q Augmentation module, which was followed by a physical examination and photographs.

Sample Size Calculation

According to previous research, we defined a clinically relevant change in the health-related quality of life as a difference that exceeds half a standard deviation of the baseline value.[16,17] Because greater standard deviation of all scores at baseline is approximately 25 for the sexual well-being BREAST-Q subscale in our study population, the minimum significant difference for each subscale is estimated as 13. When the power is set at 80 percent with a standard α of 0.05 and a minimum difference of 13, a minimum sample size of 32 patients was calculated for this study, using the equation for a one-sample paired *t* test.

Statistical Analysis

Descriptive data were calculated for continuous variables (i.e., mean, standard deviation, median, interquartile range, minimum, and maximum) and categorical variables (i.e., number and frequency). The responsiveness of the BREAST-Q scales was examined at the group level by testing the difference between scores at baseline and after breast augmentation. Because of nonnormal distribution of BREAST-Q scores, we described them with median and interquartile range, and we used the nonparametric Wilcoxon signed rank

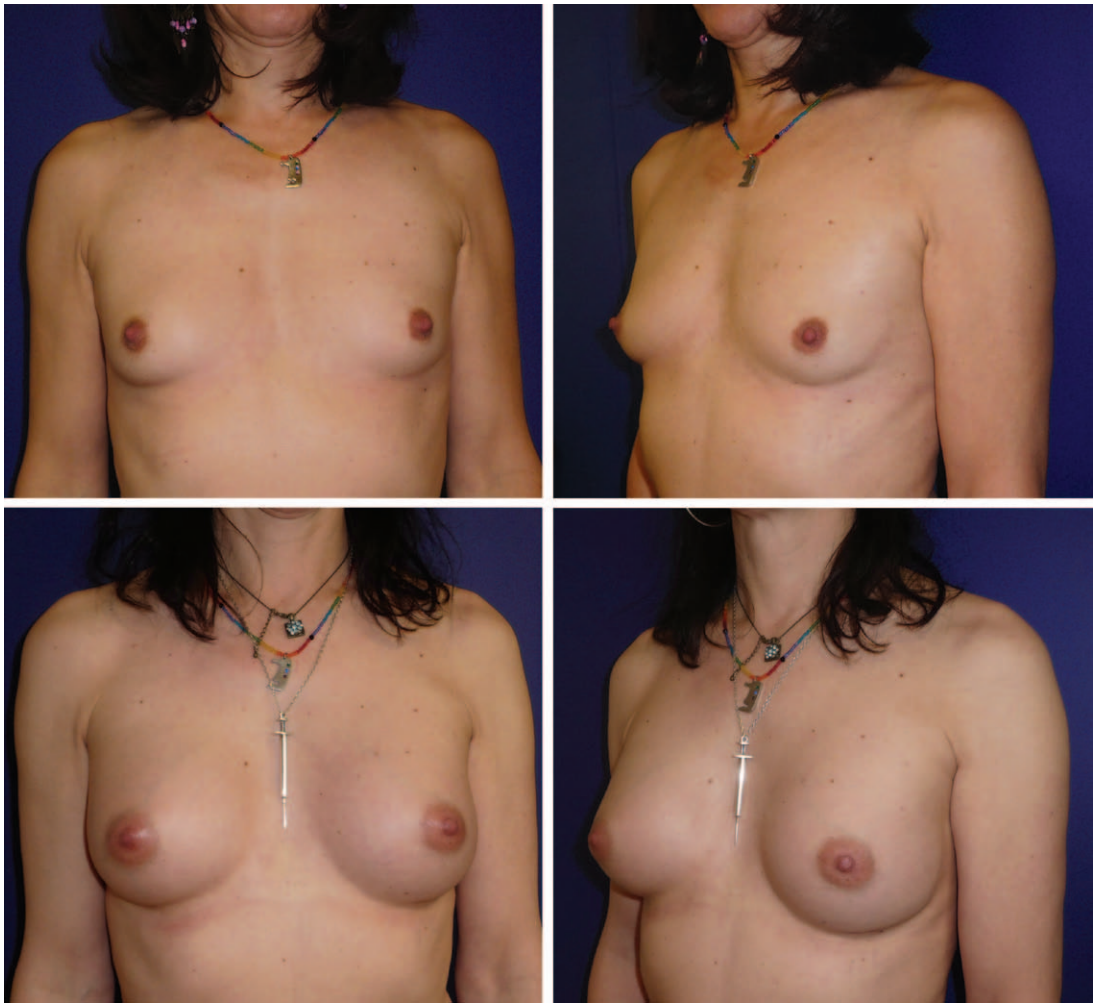

Fig. 2. (*Above*) Preoperative views. (*Below*) Four months after implantation with Esthea moderate-profile 325-cc implants.

test for repeated-measures analysis. We then calculated the standard indicator Kazis effect size calculation, defined as the difference between means of presurgery and postsurgery scores divided by the standard deviation for the data.[18] Larger effect sizes indicate greater responsiveness, and it is standard practice to interpret the magnitude using Cohen's arbitrary criteria, where 0.2 to 0.5 indicates a small effect size, 0.5 to 0.8 indicates a medium effect size, and greater than 0.8 indicates a large effect size.[19]

Outcomes assessed by the BREAST-Q were also described at the individual patient level. This was achieved by classifying each patient according to score change between visits. We used our study definition of "minimum significant difference" of 13 (see earlier under Sample Size Calculation) to define five categories: significant improvement (change $\geq +13$ points), nonsignificant improvement ($0 <$ change $< +13$), no change (change $= 0$), nonsignificant worsening ($-13 <$ change < 0), and significant worsening (change ≤ -13). We then counted the number and frequency of people achieving each level of change.

Finally, we compared BREAST-Q scores and changes according to implant breast volume using the nonparametric Kruskal-Wallis test. All analyses were performed with a significance level of 0.05, using the SAS Statistical Package (version 9.2; SAS Institute, Inc., Cary, N.C.).

RESULTS

Figures 2 and 3 show postoperative results over time.

Patient Characteristics

A total of 35 patients were recruited for participation. Table 1 lists characteristics of the study sample. In the study, male-to-female transsexual

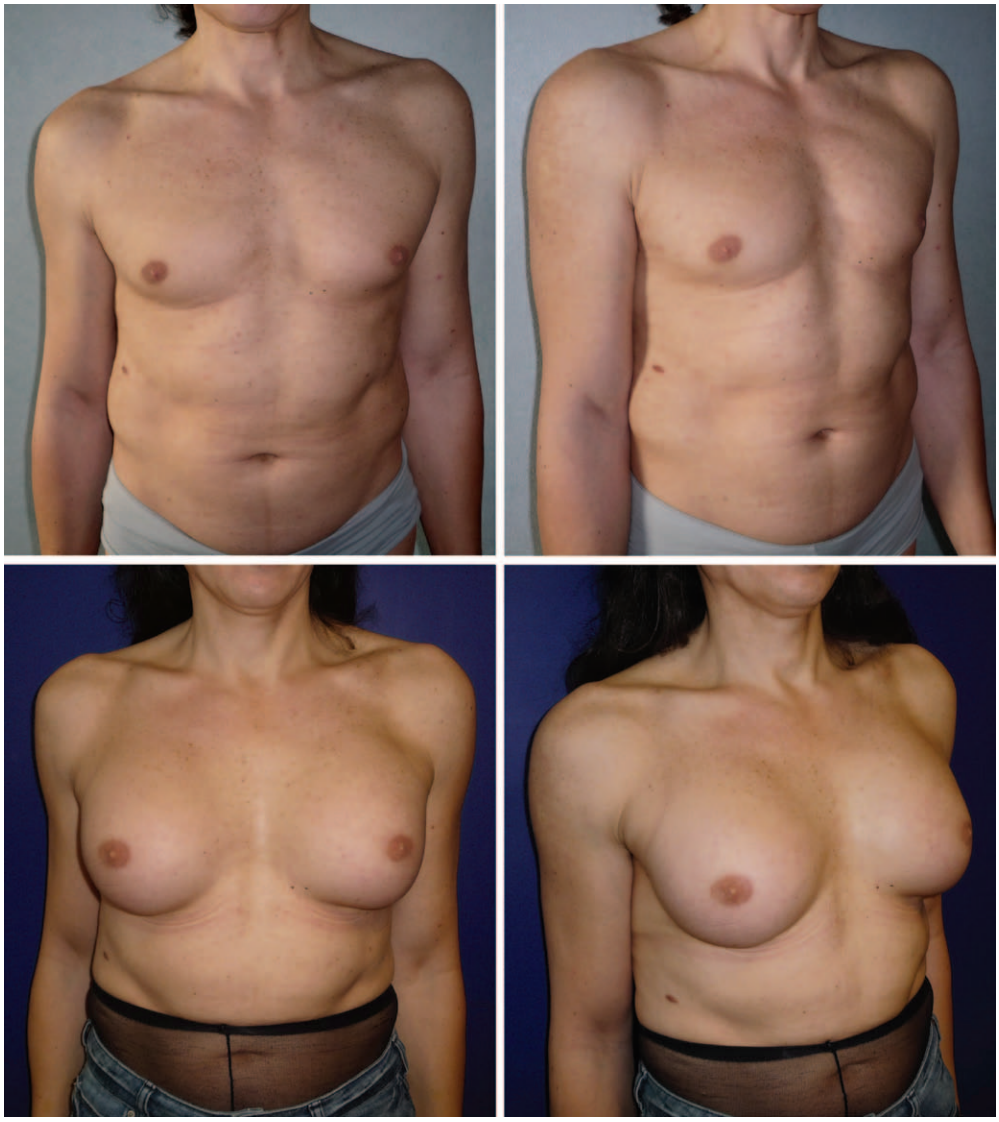

Fig. 3. (*Above*) Preoperative views. (*Below*) Eighteen months after implantation with Esthea high-profile 375-cc implants.

patients were most often patients who had begun late transition and therefore had a high average age at surgery (42.2 years). The high average size (173.9 cm) regarding masculinity of the patients is counterbalanced by a normal body mass index. Similarly, breast width (13.1 cm) was large regarding masculine chest anatomy. Hormone therapy was started long before the procedure; the World Professional Association for Transgender Health recommends waiting at least 12 months before breast augmentation. Breast surgery was performed on average 16 months after sex reassignment surgery, in relation to vaginoplasty recovery time. All patients completed the BREAST-Q both 3 weeks preoperatively and at a median of 4.0 months (interquartile range, 4.0 to 4.0 months; range, 3.8 to 4.0 months) following augmentation. Twenty-one patients completed the BREAST-Q again at a median of 20.7 months (interquartile range, 8.1 to 28.3 months; range, 12.0 to 39.6 months).

Table 2 lists treatment characteristics. Patient morphology induced high-volume implants (327 ml). In addition, pocket implant was most often located in the retropectoral position (77 percent). Hospitalization stay was long because patients were kept until drains were removed (5.5 days). None of the patients had significant postoperative complications after breast augmentation (Table 2).

BREAST-Q Scores

Evolution of BREAST-Q subscales scores is illustrated in Figure 4. BREAST-Q subscale scores for

Table 1. Characteristics of Male-to-Female Transsexual Patients Undergoing Breast Augmentation Surgery*

	Mean ± SD	Range	No. (%)
Age at time of BA, yr	42.2 ± 12.6	18.9–62.6	
Length, cm	173.9 ± 6.6	159.0–184.0	
Weight, kg	68.6 ± 11.9	49.0–89.0	
BMI, kg/m^2	22.7 ± 3.5	17.0–29.4	
Age of hormonal therapy, yr	4.9 ± 4.2	1.3–16.7	
Age of SRS, mo	15.9 ± 17.1	4.5–81.0	
Sternal notch–to-nipple distance, cm	21.6 ± 3.6	17.0–34.0	
Breast width, cm	13.1 ± 2.7	9.0–20.0	
Socioprofessional group			
Artisan, storekeeper			12 (34)
Employed full time or part time			10 (29)
Retired			4 (11)
Unemployed/ students/others			9 (26)
Active smoking			12 (34)

BA, breast augmentation; BMI, body mass index; SRS, sex reassignment surgery.
*July 30, 2012, end of follow-up, Bordeaux University Hospital, Bordeaux, France (n = 35).

Table 2. Surgical Characteristics of Breast Augmentation Surgery Performed on Male-to-Female Transsexual Patients*

	Mean ± SD	Range	No. (%)
Breast implant volume, ml	327 ± 61	190.0–425.0	
Procedure length, min	86 ± 20	60.0–120.0	
Hospitalization stay, days	5.5 ± 1.5	4.0–10.0	
Pocket used			
Subglandular			8 (23)
Subpectoral			27 (77)
Type of implant			
ELP			11 (31)
EHP			18 (51)
ESHP			6 (17)
Complications			
Hematoma			0 (0)
Infection			0 (0)
Capsular contracture			0 (0)

ELP, Esthea Low profile; EHP, Esthea High profile; ESHP, Esthea Super–high profile.
*July 30, 2012, end of follow-up, Bordeaux University Hospital, Bordeaux, France (n = 35).

satisfaction with breasts, psychosocial well-being, and sexual well-being were significantly higher at both postoperative times than the baseline values (Tables 3 and 4). Satisfaction with breast increased by 59 points ($p < 0.0001$) at 4 months and 47 points ($p < 0.0001$) later. A significant improvement in psychosocial well-being was assessed at 4 months (48 points, $p < 0.0001$) and later (37 points, $p < 0.0001$). Sexual well-being increased by 34 points ($p < 0.0001$) at 4 months and 33 points ($p = 0.0003$) later. BREAST-Q subscale physical well-being had a nonsignificant change at both postoperative times: –10 points ($p = 0.1131$) at 4 months and +6 points ($p = 0.3265$) later.

Satisfaction with breast Kazis effect size was very large at 4 months and later, matching with a significant improvement in 97 percent of patients at 4 months and 95 percent later. Kazis effect sizes were large for psychosocial well-being and sexual well-being matching, respectively, with a significant improvement in 85 percent and 86 percent at 4 months and 76 percent and 70 percent later (Tables 3 and 4).

When comparing BREAST-Q subscale between subjects with breast implant volume lower or higher than the mean, only sexual well-being at 4 months after surgery is different. Subjects with breast volume implant below average (n = 17) were more sexually satisfied than subjects with volume implant above average (n = 14) (median, 100 versus 65; mean, 86.7 versus 61.4; $p = 0.001$).

DISCUSSION

Although breast augmentation in male-to-female transsexuals was studied extensively in the late 1990s, the impact on well-being has never been measured before. Acquiring a female phenotype through hormonal and surgical treatments is essential for male-to-female transsexuals to undo the incongruity between their mind and their body. Transsexual patients perceive the breasts as a strong image of the feminine gender and seek feminization through breast surgery. The study's goal was to measure changes in patient satisfaction level with breasts and sexual, psychosocial, and physical well-being after breast augmentation in male-to-female transsexuals using a valid, reliable, and responsive patient-reported outcome measure (i.e., BREAST-Q). The current results indicate that gains are statistically significant and clinically meaningful as early as 4 months after surgery and later. In this study, procedure length was longer than in native women because we mostly had to choose a retropectoral pocket and the pectoralis muscle was strong.

The high rate of satisfaction with breasts might be explained by the large average volume of implanted prostheses in this study (327 ml) that is, to us, adequate with anatomical characteristics of male-to-female transsexual patients' chests. In 1999, Kanhai et al. had noticed that the average volume had doubled between 1979 and 1996, going from 165 ml to 287 ml, without mentioning a correlation between volume and patients' physical characteristics.[4] In their study, they observed a satisfaction rate of 75 percent at 4.8 years, consistent with the

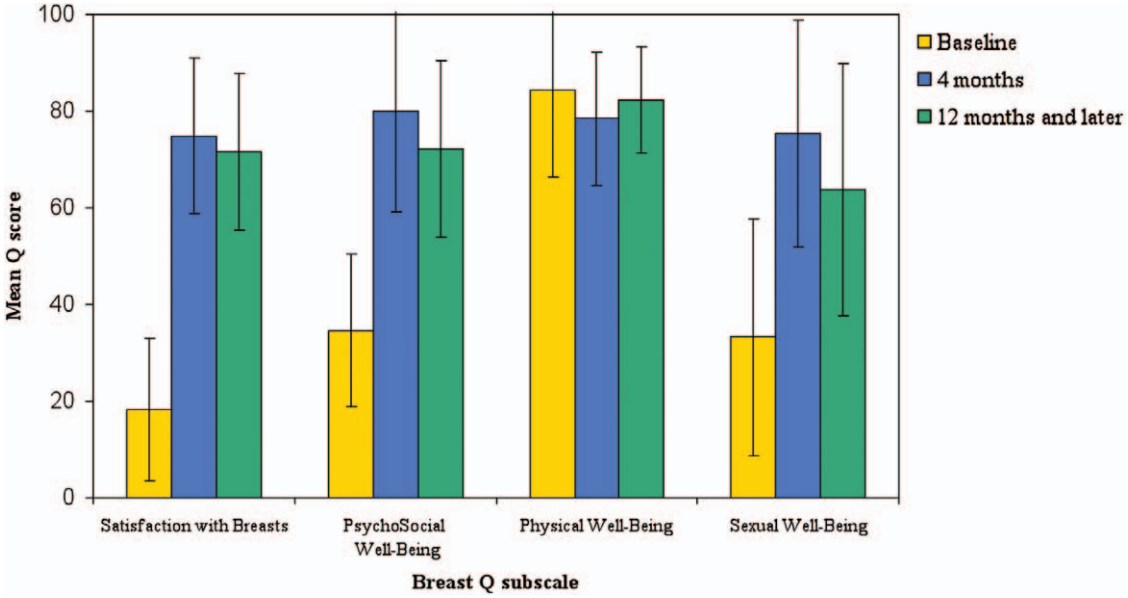

Fig. 4. BREAST-Q subscale scores at baseline and at 4 months and 12 months after surgery ($n = 35$, $n = 35$, and $n = 21$, respectively; except for sexual well-being, where $n = 29$, $n = 31$, and $n = 21$, respectively).

Table 3. Distribution of BREAST-Q Augmentation Module Subscales and Change from before Surgery to 4 Months after Surgery among Male-to-Female Transsexual Patients Undergoing Breast Augmentation Surgery*

	Satisfaction with Breasts	Psychosocial Well-Being	Sexual Well-Being	Physical Well-Being
No.	35	35	27	35
Before surgery				
Mean ± SD	18 ± 15	35 ± 16	33 ± 25	84 ± 18
Median (IQR)	19 (0–26)	36 (23–48)	29 (20–42)	100 (70–100)
After surgery				
Mean ± SD	75 ± 16	80 ± 21	75 ± 24	79 ± 14
Median (IQR)	77 (61–85)	85 (58–100)	72 (63–100)	79 (76–84)
Change				
Mean ± SD	57 ± 25	46 ± 29	40 ± 26	−6 ± 19
Median (IQR)	59 (42–74)	48 (16–64)	34 (20–59)	−10 (−24–6)
p†	<0.0001	<0.0001	<0.0001	0.1131
Kazis effect size‡	3.8	2.9	1.6	−0.3
Change, no. (%)§				
Significant improvement	34 (97)	30 (85)	23 (86)	6 (17)
Nonsignificant improvement	1 (3)	2 (6)	2 (7)	6 (17)
No change	0 (0)	2 (6)	0 (0)	4 (11)
Nonsignificant worsening	0 (0)	0 (0)	2 (7)	2 (6)
Significant worsening	0 (0)	1 (3)	0 (0)	17 (49)

IQR, interquartile range.
*July 30, 2012, end of follow-up, Bordeaux University Hospital, Bordeaux, France ($n = 35$).
†*p* value for Wilcoxon signed rank test.
‡Mean change/SD before surgery (0.2–0.5 = small; 0.5–0.8 = medium; >0.8 = large).
§Significant improvement (change ≥ +13 points), nonsignificant improvement (0 < change < +13), no change (change = 0), nonsignificant worsening −13 < change < 0), and significant worsening (change ≤ −13).

satisfaction rate of our study of 67 percent at 21 months. So far, interpretation of sexual satisfaction with breast implantation is biased by outcomes of sexual reassignment[20] and brings into light complex considerations, making interpretation difficult. However, sexual well-being was more improved in patients with implanted volumes under the mean. Although biases could exist (e.g., selection of patients, confusion with other variables), this consideration allows surgeons to propose smaller implants and then improve satisfaction.

Whereas changes in physical well-being are nonsignificant in this study, it would be interesting to measure the impact of breast augmentation in male-to-female transsexual patients at work and during sport practice. No such study was considered in native women.

Table 4. Distribution of BREAST-Q Augmentation Module Subscales and Change between before Surgery and 12 Months after Surgery and Later among Male-to-Female Transsexual Patients Undergoing Breast Augmentation Surgery*

	Satisfaction with Breasts	Psychosocial Well-Being	Sexual Well-Being	Physical Well-Being
No.	21	21	17	21
Before surgery				
Mean ± SD	23 ± 14	40 ± 10	39 ± 28	77 ± 18
Median (IQR)	26 (19–31)	40 (34–48)	29 (20–49)	72 (59–100)
After surgery				
Mean ± SD	72 ± 16	72 ± 18	64 ± 26	82 ± 11
Median (IQR)	68 (65–77)	76 (62–85)	72 (45–85)	79 (76–90)
Change				
Mean ± SD	49 ± 21	32 ± 22	29 ± 23	6 ± 23
Median (IQR)	47 (39–69)	37 (28–49)	33 (12–39)	6 (0–25)
p†	<0.0001	<0.0001	0.0003	0.3265
Kazis effect size‡	3.3	2.0	1.2	0.3
Change, no. (%)§				
Significant improvement	20 (95)	16 (76)	12 (70)	8 (38)
Nonsignificant improvement	1 (5)	2 (10)	3 (18)	6 (29)
No change	0 (0)	2 (10)	0 (0)	2 (9)
Nonsignificant worsening	0 (0)	0 (0)	2 (12)	0 (0)
Significant worsening	0 (0)	1 (4)	0 (0)	5 (24)

IQR, interquartile range.
*July 30, 2012, end of follow-up, Bordeaux University Hospital, Bordeaux, France ($n = 35$).
†p value for Wilcoxon signed rank test.
‡Mean change/SD before surgery (0.2–0.5 = small; 0.5–0.8 = medium; >0.8 = large).
§Significant improvement (change ≥ +13 points), nonsignificant improvement (0 < change < +13), no change (change = 0), nonsignificant worsening (−13 < change < 0), and significant worsening (change ≤ −13).

McCarthy et al. have already confirmed the positive psychological effects of breast augmentation in native women, with similar effect sizes.[21] Whereas native women seek satisfaction with their breasts through breast augmentation, male-to-female transsexual patients seem to look for better social integration. Evaluation of this parameter appears to be of utmost importance for proposing this procedure to male-to-female transsexual patients. This study detects positive psychosocial changes associated with surgery. Murphy et al., in 2009, in a psychosocial quality of life after breast augmentation study, referred to the fact that the Short Form-36 Health Survey currently used to determine the impact of an intervention on the quality of life was especially weighted with questions regarding physical health problems,[22] whereas the BREAST-Q enables change in psychosocial well-being to be measured.

Despite meaningful results on quality of life, this study has some significant limitations. A significant number of questionnaires were missing in the long term (14 of 35 patients). Eight patients were interviewed too early, as less than 6 months had elapsed since the intervention, and six patients were lost to follow-up. Quantitative data (i.e., age, size, weight, body mass index, sternal notch–to-nipple distance, and breast width) at inclusion of loss to follow-up were on average higher, resulting in a selection of larger prostheses (350 ml versus 325 ml) and implant insertion in the prepectoral pocket in more than 60 percent of cases (unlike 75 percent of cases for patients reinterviewed later). Patients lost to follow-up had better improvement in satisfaction with breasts at 4 months (+91 versus +46). It can be assumed that this improvement of satisfaction is extended in time, which supports the significant findings of this study in the long term. Besides, it has been suggested that satisfaction associated with breast augmentation may be compromised by postoperative complications,[23] and none of the patients had complications during the follow-up period. Furthermore, only anatomical implants were used in this study. A single-blind prospective study comparing anatomical versus round implants should evaluate the impact of implant selection on outcomes.

It is necessary to analyze these findings not only exclusively based on their statistical significance but also in view of their clinical significance. Effect sizes, such as Kazis effect size, can measure the strength of change and then can help interpret the data. Nevertheless, Kazis effect size calculation is based on the hypothesis of normal distribution of variables that is not satisfied in our study. However, the magnitude of the results is strong enough to support this. Effect sizes were large for the three scale mean change scores, and the vast majority of individual patients underwent highly significant improvement. This finding strongly supports the hypothesis that breast augmentation in male-to-female transsexuals can have a significant and wide positive impact on a

patient's satisfaction with breasts, psychosocial well-being, and sexual well-being.

According to this study, breast augmentation in male-to-female transsexual patients significantly improves satisfaction with breasts and global psychosocial well-being. However, improvement of sexual well-being is to be balanced with outcomes of sexual reassignment, marital status, and probably other complex personal situations. Finally, physical abilities are not altered significantly, which could have worried some patients who were in stereotypical male trades.

On the basis of our findings, demand exists at all ages, in all occupations, and with all physical aspects regarding height, weight, and body mass index. In France, once approval is granted by a medical insurance counselor, all of the procedure is paid for by the national health insurance; the results of our study support this policy.

In addition, these results could be affected by the onset of capsular contractures in following years and suggests an extended follow-up study. With this aim in mind, we continue the inclusion of patients to gain perspective and increase the power of the study.

Through breast augmentation, the male-to-female transsexual patient improves identification with the female gender and therefore is socially integrated. Regarding results, this study supports breast augmentation in this population. It would be interesting to measure how the surgery affects the patient's work and artistic production.

Romain Weigert, M.D.
Plastic Surgery and Burns Unit
University Hospital of Bordeaux
Centre FX Michelet
Place Amélie Raba Léon
33076 Bordeaux, France
romain.weigert@chu-bordeaux.fr

ACKNOWLEDGMENTS

The authors thank Adélaïde Doussau for methodologic and statistical advice and Evelyne Le Tallec for assistance in the English translation of the article.

REFERENCES

1. Orentreich N, Durr NP. Proceedings: Mammogenesis in transsexuals. *J Invest Dermatol.* 1974;63:142–146.
2. Ratnam SS, Lim SM. Augmentation mammoplasty for the male transsexual. *Singapore Med J.* 1982;23:107–109.
3. Kanhai RC, Hage JJ, Karim RB, Mulder JW. Exceptional presenting conditions and outcome of augmentation mammaplasty in male-to-female transsexuals. *Ann Plast Surg.* 1999;43:476–483.
4. Kanhai RC, Hage JJ, Asscheman H, Mulder JW. Augmentation mammaplasty in male-to-female transsexuals. *Plast Reconstr Surg.* 1999;104:542–549; discussion 550.
5. Kanhai RC, Hage JJ, Mulder JW. Long-term outcome of augmentation mammaplasty in male-to-female transsexuals: A questionnaire survey of 107 patients. *Br J Plast Surg.* 2000;53:209–211.
6. Kanhai RC, Hage JJ, Karim RB. Augmentation mammaplasty in male-to-female trans-sexuals: Facts and figures from Amsterdam. *Scand J Plast Reconstr Surg Hand Surg.* 2001;35:203–206.
7. The World Professional Association for Transgender Health. Standards of care for the health of transsexual, transgender, and gender nonconforming people. 7th Version, 2011. Available at: http://www.wpath.org. Accessed June 15, 2012.
8. Pusic AL, Klassen AF, Scott AM, Klok JA, Cordeiro PG, Cano SJ. Development of a new patient-reported outcome measure for breast surgery: The BREAST-Q. *Plast Reconstr Surg.* 2009;124:345–353.
9. Lohr KN; Scientific Advisory Committee of the Medical Outcomes Trust. Assessing health status and quality-of-life instruments: Attributes and review criteria. *Qual Life Res.* 2002;11:193–205.
10. Cano SJ, Hobart JC. Watch out, watch out, the FDA are about. *Dev Med Child Neurol.* 2008;50:408–409.
11. Mokkink LB, Terwee CB, Patrick DL, et al. The COSMIN checklist for assessing the methodological quality of studies on measurement properties of health status measurement instruments: An international Delphi study. *Qual Life Res.* 2010;19:539–549.
12. Pusic AL, Chen CM, Cano S, et al. Measuring quality of life in cosmetic and reconstructive breast surgery: A systematic review of patient-reported outcomes instruments. *Plast Reconstr Surg.* 2007;120:823–837; discussion 838.
13. Klassen AF, Pusic AL, Scott A, Klok J, Cano SJ. Satisfaction and quality of life in women who undergo breast surgery: A qualitative study. *BMC Womens Health* 2009;9:11.
14. Cano SJ, Klassen AF, Scott AM, Cordeiro PG, Pusic AL. The BREAST-Q: Further validation in independent clinical samples. *Plast Reconstr Surg.* 2012;129:293–302.
15. *Q-Score Scoring Software.* Available at: http://webcore.mskcc.org/breastq/. Accessed August 10, 2012.
16. Farivar SS, Liu H, Hays RD. Half standard deviation estimate of the minimally important difference in HRQOL scores? *Expert Rev Pharmacoecon Outcomes Res.* 2004;4:515–523.
17. Norman GR, Sloan JA, Wyrwich KW. The truly remarkable universality of half a standard deviation: Confirmation through another look. *Expert Rev Pharmacoecon Outcomes Res.* 2004;4:581–585.
18. Kazis LE, Anderson JJ, Meenan RF. Effect sizes for interpreting changes in health status. *Med Care* 1989;27(Suppl):S178–S189.
19. Cohen J. The analysis of variance. In: Cohen J. *Statistical Power Analysis for the Behavioral Sciences.* 2nd ed. Hillsdale, NJ: Lawrence Erlbaum Associates; 1988:273–288.
20. Klein C, Gorzalka BB. Sexual functioning in transsexuals following hormone therapy and genital surgery: A review. *J Sex Med.* 2009;6:2922–2939; quiz 2940.
21. McCarthy CM, Cano SJ, Klassen AF, et al. The magnitude of effect of cosmetic breast augmentation on patient satisfaction and health-related quality of life. *Plast Reconstr Surg.* 2012;130:218–223.
22. Murphy DK, Beckstrand M, Sarwer DB. A prospective, multicenter study of psychosocial outcomes after augmentation with natrelle silicone-filled breast implants. *Ann Plast Surg.* 2009;62:118–121.
23. Cash TF, Duel LA, Perkins LL. Women's psychosocial outcomes of breast augmentation with silicone gel-filled implants: A 2-year prospective study. *Plast Reconstr Surg.* 2002;109:2112–2121; discussion 2122.